

Remarks

This application has been reviewed in light of the Office Action of April 15, 2002. Claims 1-20 are pending, and all claims stand rejected. In response, claims 1, 7-9, 12, and 18-19 are amended, and the following remarks are submitted. Reconsideration of this application, as amended, is requested.

Claims 1-20 are rejected under 35 USC 112. The various grounds are addressed next.

The usages of the phrases "coating source" and "contacting" are said to be unclear. The Examiner's point is well taken, and claims 1, 8, 12, and 19 have been amended responsively. The coating source includes a solid aluminum halide, a solid fluoride or iodide of the modifying elements, see 88 and 92 in Figures 4-5, and the carrier gas 96. Upon heating, the coating gas is produced from these constituents and flows to contact the article to be coated. Claims 1 and 12 are amended to clarify this point. These amendments also help to distinguish the prior art teachings, as will be discussed subsequently. Claims 8 and 19 each recite the case where the solid iodide or fluoride do not contact the surface that is being coated, but in other instances they may contact the surface being coated, as distinct from the approach of claims 9 and 20 where the solid fluoride or iodide is applied to the surface of the substrate..

The term "nickel-base" means that the alloy contains more nickel than any other element. Terms such as "X-base" (where X is an element, e.g., nickel, iron, titanium) are commonly encountered terms of art in metallurgy. Many US patents use this term, and it is defined in many US patents. See, for example, US Patents 6,296,447; 6,383,306; and 6,413,584, all filed at about the same time as the present application.

In claims 7 and 18, the term "the elemental solid modifying element" lacks antecedent basis, and has been modified responsively. See item 94 of Figures 4-5.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Claims 1-2 and 4-11 are rejected under 35 USC 103 over Warnes '733 in view of Basta '963. Applicant traverses this ground of rejection.

The following principle of law applies to all sec. 103 rejections. MPEP 2143.03 provides "To establish prima facie obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)." [emphasis added] That is, to have any expectation of rejecting the claims over a single reference or a combination of references, each limitation must be taught somewhere in the applied prior art. If limitations are not found in any of the applied prior art, the rejection cannot stand. In this case, the applied prior art references clearly do not arguably teach some limitations of the claims.

Claim 1 recites in part:

"preparing a coating source comprising:  
a solid aluminum halide,  
a solid fluoride or a solid iodide of a modifying element  
as a source of the modifying element, the modifying element being  
selected from the group consisting of zirconium, hafnium, and yttrium,  
and combinations thereof, and  
a carrier gas;  
producing a coating gas from the coating source, the coating gas  
comprising a gaseous aluminum halide, a gaseous fluoride or a gaseous  
iodide of the modifying element, and the carrier gas;"

As the Office Action notes at page 4, lines 2-3, the references teach that "...metal fluorides, including those of aluminum, hafnium, and zirconium, may be formed as CVD precursors by the analogous method of flowing HF over the metal sources..." That is not what amended claim 1 recites, or what the present Specification discloses. For example, the solid fluoride such as zirconium fluoride, hafnium fluoride, or yttrium

fluoride is present as a solid material, which then vaporizes or sublimates to produce the respective gas. The sec. 112 clarification of the solid materials of the coating source as distinct from the coating gas produced from those coating source also clarifies this point.

Neither reference teaches that a solid fluoride or iodide of the modifying element is provided as the source of the gaseous fluoride or iodide, or is present at any time in the system. Basta instead teaches that a metal is provided, and the metal is reacted with a gas to produce the gaseous fluoride.

The rejected dependent claims incorporate this limitation, and are accordingly not made obvious. They are additionally patentable for reasons that need not be addressed at this point.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Claims 3 and 12-20 are rejected under 35 USC 103 over Warnes '733 in view of Basta '963, and further in view of Basta '614. Applicant traverses this ground of rejection.

Claim 3 depends from claim 1, and incorporates the limitation quoted above from claim 1. Claim 12 has a similar recitation, reciting in part:

“preparing a coating source comprising:  
a solid aluminum halide,  
a solid fluoride of a modifying element as a source of the  
modifying element, the fluoride of the modifying element being selected  
from the group consisting of a zirconium fluoride and a hafnium  
fluoride, and combinations thereof, and  
a carrier gas;  
producing a coating gas from the coating source, the coating gas  
comprising a gaseous aluminum halide, a gaseous fluoride or a gaseous

iodide of the modifying element, and the carrier gas;"

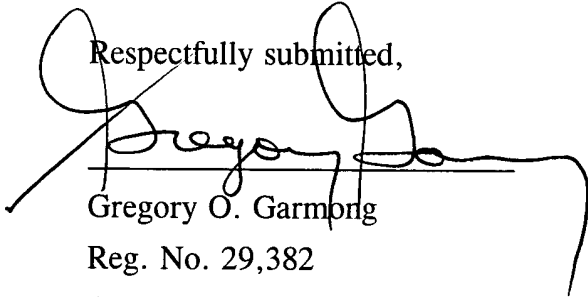
Warnes and Basta '963 do not teach this limitation for the reasons stated above in relation to the first rejection, which are incorporated here. Basta '614 adds nothing in this regard. Once again, the references do not teach the presence of a solid fluoride that vaporizes to produce the corresponding gaseous fluoride, and instead teach that fluorine gas is passed over the metal to produce the gaseous fluoride.

The rejected dependent claims incorporate this limitation, and are accordingly not made obvious. They are additionally patentable for reasons that need not be addressed at this point.

Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

Applicant submits that the application is in condition for allowance, and requests such allowance.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

underlined material is to be inserted, [bracketed] material is to be deleted, and --material set off by dashes-- is to be added.

Claims:

1. (Amended) A method for coating an article, comprising the steps of:  
providing the article having a surface;  
preparing a coating source comprising:  
[an] a solid aluminum halide,  
a solid fluoride or [an] a solid iodide of a modifying element as a source of the modifying element, the modifying element being selected from the group consisting of zirconium, hafnium, and yttrium, and combinations thereof, and  
a carrier gas;  
producing a coating gas from the coating source, the coating gas comprising a gaseous aluminum halide, a gaseous fluoride or a gaseous iodide of the modifying element, and the carrier gas; and  
contacting the coating [source] gas to the article; and simultaneously  
heating the coating [source] gas and the article to a coating temperature of at least about 1850°F for a period of time sufficient to permit aluminum and the modifying element to coat onto the surface of the article.
7. (Amended) The method of claim 1, wherein the coating source further includes [the] an elemental solid modifying element.
8. (Amended) The method of claim 1, wherein the step of contacting the coating [source] gas includes the step of

providing the solid fluoride or the solid iodide of the modifying element separated from the article surface.

9. (Amended) The method of claim 1, wherein the step of contacting the coating source includes the step of

providing the fluoride or the iodide [fluoride] of the modifying element applied to the article surface.

12. (Amended) A method for coating an article, comprising the steps of: providing the article having a surface, the article being an airfoil; preparing a coating source comprising:

[an] a solid aluminum halide,

a solid fluoride of a modifying element as a source of the modifying element, the fluoride of the modifying element being selected from the group consisting of a zirconium fluoride and a hafnium fluoride, and combinations thereof, and

a carrier gas;

producing a coating gas from the coating source, the coating gas comprising a gaseous aluminum halide, a gaseous fluoride or a gaseous iodide of the modifying element, and the carrier gas; and

contacting the coating [source] gas to the surface of the airfoil; and simultaneously

heating the coating [source] gas and the article to a coating temperature of from about 1850°F to about 2000°F for a period of time sufficient to permit aluminum and the modifying element to coat onto the surface of the airfoil.

18. (Amended) The method of claim 12, wherein the coating source further includes [the] an elemental solid modifying element.

19. (Amended) The method of claim 12, wherein the step of contacting the coating [source] gas includes the step of

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providing the solid fluoride of the modifying element separated from the airfoil surface.

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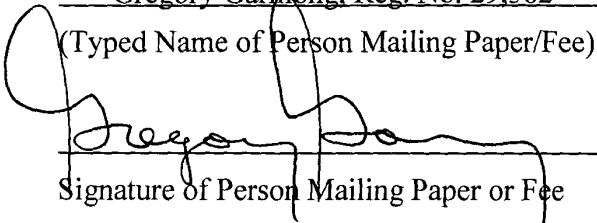
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Fee Transmittal  
Amendment

SN 09/670,189

GE 13DV-13658/11593